followed by a condition of hemiplegia more or less persistent, with other alarming symptoms. The patient recovered under the use of remedies directed, in the first instance, to the relief of the gastric and intestinal irritation, which was looked upon as the chief exciting cause of the symptoms observed, and, towards the decline of the disease, to the removal of the anæmic and debilitated condition in which the patient was left. The author concluded with the remark that this case, in which the patient recovered perfectly, and in which, therefore, there could not have been any cerebral mischief, notwithstanding the formidable appearance of the symptoms, shows how little we can rely on symptoms alone in forming a diagnosis in cerebral affections, especially when the case is compared with one, a report of which, by the author, was read before the Society last October, in which latter case, with less formidable symptoms, the patient died in a few hours, and serous effusion in the brain, with other cerebral disease, were found on a post-mortem examination.—*Med. Times and Gaz.*, February 16, 1861.

56. *Puerperal Fever complicated with Diphtheria, in which life was saved by the Tincture of Sesquichloride of Iron.*—Mr. ROBERT DRUIT reported the following example of this to the Obstetrical Society of London (Feb. 6, 1861). A healthy woman, aged 42, was attacked on the 7th July, after labour, with shivering and violent pain in the left leg. The pain soon left the leg, and seized the left side below the mamma. There were extreme restlessness, heat of skin, and prostration. On the third day of the illness, violent fetid diarrhœa was established. On the ninth day, the diarrhœa had continued incessantly; the motions thin, reddish, and offensive, passed involuntarily; the patient drowsy, wandering, and picking the bedclothes; when there came on great constriction in the throat, difficulty of swallowing, and copious salivation, together with a diphtheritic exudation at the back of the fauces. The most lavish administration of port wine, brandy, beef-tea, opiates, and quinine, had failed to stay the progress of the malady, and the patient was evidently sinking, when, at the suggestion of Dr. Frere, who was called in consultation, the tincture of sesquichloride of iron was given. The effect was decided and unmistakable. The contents of the alimentary canal were deodorized, and the diarrhœa ceased within twenty-four hours; and, spite of difficulty of swallowing and the throat complication, the patient rapidly became convalescent. The diphtheritic exudation extended over the posterior half of the soft palate. The upper lobe of the left lung was left consolidated; but in the twelvemonth which has since elapsed it has entirely recovered its normal condition. The quantity in which the tincture of steel was administered deserves notice. Three fluidounces of the tincture were swallowed in five days, besides an ounce wasted in lavements. During the first day that it was given, the patient took two fluidrachms every two hours. It is evident that these doses did good, and it is probable that smaller ones might have failed. —*Ibid.*

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57. *On the Nature of Death from the Administration of Anæsthetics, especially Chloroform and Ether, as observed in Hospitals.*—Dr. CHARLES KIDD read an interesting paper on this subject before the Physiological Subsection of the British Association for the Advancement of Science. We are indebted for the following abstract of this paper to the *British Medical Journal* (Sept. 22, 1860):—

From data already collected and tabulated, it appeared not difficult to explain and to offer some new directions as to the nature of death from anæsthetics, a subject of serious importance in medical practice: and the author having collected and tabulated 109 deaths from chloroform and 24 from ether (including 2 from amylene), believes himself in a position to give an explanation of these accidents.

Of these 133 deaths, 90 occurred in male patients; and about half, or 43, were females, though anæsthetics have been largely used in midwifery practice. Accidents in children, too, have been almost unknown, though chloroform has been used in such cases very extensively; this immunity from danger in diseases of children and women being very marked.

There have been already about from 250,000 to 300,000 operations of various kinds performed under the influence of anæsthetics, chiefly under chloroform, including every variety of serious surgical accident; several hundreds of the patients had been, for such very serious operations as resections of joints, large amputations, ovariotomy and other female cases, ligature of large arteries, etc., more than an hour fully anæsthetized; yet in this large mass of serious surgical operations, there had not been any well attested instance of death from stoppage of the functions of life, or narcotism of the system by the chloroform. On the contrary, fully 80 per cent. of the deaths, and nearly all the deaths from chloroform, had occurred in trivial operations, from very small doses, *suddenly* before the anæsthetic had produced its full effect. It was not sought to be argued (though not very clearly established) that death in the human subject might not be produced by long-continued inhalation of chloroform; it seemed only established that this was not at all the mode in which death had been observed to occur in hospital practice.

The author suspected that, anæsthesia once established in a favourable subject, respiratory action was diminished, and that inhalation or normal respiration continued on a diminished scale also, almost after the manner of hybernation in warm-blooded animals; but, respiration once disturbed, attended by spasm of the glottis through the recurrent laryngeal nerves, especially in strong healthy but nervous subjects, for trivial operations, as tooth-drawing, whitlow, strabismus, caustic to warts, etc., death might occur, and usually had occurred, from a few drops of chloroform. Nevertheless, a law of tolerance of chloroform had been long established in hospitals, that where a patient was labouring under old disease, pain of a neuralgic kind, etc., he bore chloroform best; patients with long continued stertor had taken thus a pint of chloroform in well regulated doses at a single inhalation; one lady had sixty-two ounces in twelve days for intense pain, with good effect; another, two hundred ounces in six months, also with beneficial result!

The best mode of examining the statistics for future use, according to Dr. Kidd, was twofold: first, inductively; and then by comparing certain large groups of facts loosely one with another, and forming other conclusions deductively for application in every-day practice.

Single positive instances, the author thought, did mischief logically in a subject so essentially deductive, as the examination of groups of facts connected with anæsthetics. A single instance in a purely physical science will determine the fixed atomic relations of a salt or oxide, or the diagonal of two forces, or measurements of angles, tangents, or equations, etc.; but in disease and discussions on disease, the single facts are, though positive, so varying and exceptional, the disturbing forces in disease so active and numerous, that we must have recourse to groups of similar facts, or facts tending in a particular direction (statistics), and see how we may reason from what is known to what is still dubious or unknown.

It seemed well established that excitation of certain parts of the excito-motor apparatus in the nervous system produced contraction or spasm of distant parts, such as bloodvessels, muscles, etc.; thus there are spasms of the parts of the neck, laryngismus, trachelismus, spasm of the glottis, and in actual practice under chloroform these are more to be feared than deep insensibility with stertor.

As to the somewhat casual or accidental nature of some of the deaths from chloroform, there was every year additional proof. Of 45 deaths collected by Dr. Snow, he believed five or six were from fright on the operating-table. Chloroform, it might be remembered, has now to bear the obloquy of all the preliminary mischief in operations formerly placed to the account of something else. It was curious that nearly all the deaths happened before operations, and seldom, indeed never, as the result of a long tedious operation. In 85 deaths classified, 17 were operations for hæmorrhoids, fistulæ, etc.; 14 were operations for removal of toe-nail, necrosed finger-bone, etc.; 10 were cases of tooth-extraction; 11 were operations for removal of tumours and such like; 9 were deaths in minor amputations; 6 were strabismus operations, cysts of eyelids, etc.; 9 were operations on the testis; 5 were reduction of dislocations; 1 was hernia; and 5 were delirium tremens. The broad general fact that, in 300,000 operations of all kinds, chloroform had decidedly saved 6 to 10 per cent. of lives, also tended to show that the cause of death was of a casual nature.

Looking broadly at the facts, it was found by the author that the deaths from chloroform were all sudden, and many of the nature of "fit." Chloroform has a powerful irritant action on the pneumogastric in the lung; and a like irritation by electricity, as now known, stops the action of the heart. Hence syncope may possibly occur, if this irritation or spasm of the pneumogastric and laryngeal nerves be reflected to the heart.

Chloroform, as a general fact, had had a good effect on the general result of operations in surgery. Where it has acted badly, as shown by statistics, it has probably been from a tendency of patients themselves to put off surgical operations too long, changing primary into bad secondary operations. Probably 10 per cent. of lives are still directly saved by chloroform yearly (comparing the present surgical death-rates and those in existence immediately prior to the discovery of anæsthetics in 1846). This showed, according to the author, that the cause of deaths from chloroform must be also of a casual or accidental nature, rather than as arising *ex necessitate rei*. A large number (one-fourth) of the patients also in whom death had occurred had taken chloroform before with perfect safety; one patient, a hundred times. This also corroborated the view that the cause of death is more of a casual nature than due to idiosyncrasy or the general tendency of anæsthetics.

This fact of deaths from chloroform occurring in trivial operations, and early in the administration, or in the stage of excitement, had been remarked by all the chief observers—M. Robert of Paris, M. Denonvilliers, Mr. Paget, Dr. Snow, etc. It was believed to be due to diseased heart; but this opinion had not been borne out by any group of facts; while there was the larger negative clinical fact that hundreds of surgical patients with diseased heart have had chloroform with entire safety; and that, in by far the largest number of cases of death, the heart was healthy, and the symptoms were referable to the brain. Thus, in 18 deaths, the only instances where *post-mortem* or other examination has shown any lesion, 5 deaths were the result of delirium tremens; 8 had cysts in the brain, meningitis, etc.; 2 had chorea; and there were only 3 where traces of diseased heart were suspected or found. Then, of 45 deaths collected by Dr. Snow, he believed 6 were from fright or emotional depression on the operating-table, evinced by intense nervousness; while, as regards the 24 deaths from ether, they seem to have occurred from extreme muscular relaxation, exhaustion, and hemorrhage, favoured by this condition, after, not before, operations.

There had been probably twice as many patients saved from impending death by chloroform by proper restoratives, as the number that have succumbed to its influence. All these restoratives have been directed to excite the brain and reflex system of nerves; and it is to be feared some patients were lost by venesection, used on the theory of fatty or obstructed heart. The author had found that intoxication, or delirium tremens, and hysteria, strongly contraindicate the use of chloroform; and a fact of a very curious kind, belonging to the same category, had been somewhat recently dwelt on in the battles of the Crimea, in India, at Solferino, etc., that all nervous frightened prisoners are acted on with much difficulty, and not without danger, by chloroform; excess of emotion acting like excess of sensation, necessitating very large doses of anæsthetics—a state of "exaltation of sensibility" not very far removed from that which causes spasm of the glottis, trachelismus, etc., in fatal cases. As to delirium tremens, Dr. Snow does not seem to have suspected it; but of 45 deaths, the author collected (independent of suicide cases, all through these researches omitted), he finds 9 cases probably due to intoxication or delirium tremens, though some were put down to other affections or surgical operations.

In ten cases very carefully described by accurate observers, in four there was evident sign of the heart still beating, though the respiration had ceased—one by Langenbeck; one by Mouatt in the Crimea, the single case of accident there ("death from removal of finger; patient became violent; spasm of larynx occurred; heart's action continued even after pulse and respiration"); and two others; so that it is not impossible that, if this phenomenon were watched, it would be detected more often. It appeared to the author, indeed, that we should never be safe in chloroform administration, if the heart, as he believes it to be, were not one of the *very last parts*, if not the last, to be depressed by chloroform; he rather feared implication of the respiratory tract, in the laryngeal nerves, *nœud vitale*, pneumogastrics, etc., and a disturbance of their delicate balance.

The chief conclusions arrived at were—

1. There is little, if any, benefit in choosing ether in preference to chloroform, as an anæsthetic. In "ether mixtures," the ether is first inhaled pure. Ether is to be especially avoided where we have excessive hemorrhage or muscular relaxation to fear; though in such cases as reduction of dislocations, and in midwifery, it has some points in its favour, but not in the shape of mixture with chloroform.

2. There is less cause of apprehension in administration of anæsthetics in the cases of children and females, and in serious surgical operations, provided the anæsthetic is administered skilfully, than in the cases of men of robust frame, especially if given to intoxicated habits, or the operation be connected with tendinous parts, so often followed by syncope without chloroform.

3. All hospital experience tends to corroborate the view that there is a very remarkable "law of tolerance" of chloroform observable in all bad surgical cases. Once the conjunctiva of the eyelids is insensible, the eyelids closed and normal, anæsthesia kept up with ordinary skill, there is a period of safety, with diminution of respiratory action, established almost like hybernation, but which leaves the heart unaffected. That this, rather than a single instance of death from diseased valves and chloroform; that this, seen in tens of thousands of cases, should encourage the most hopeful views on the diffusion of anæsthetics.

4. Idiosyncrasy has probably very little to do with these accidents, if we omit intoxicated habits, hysteria, tendency to "fits," etc.; so that "trials d'essai," so common hitherto, or placing a patient under several doses of chloroform on previous days to a surgical operation, is a mistake. A patient may have chloroform a hundred times, but die of its effects as surely on the next or hundred and first.

5. There are evidently two modes in which our common anæsthetics may cause death, which require watching; ether, at some distant but uncertain interval during the first twenty-four hours after a surgical operation; but chloroform, like lightning, in an instant, if the inhalation be not stopped. Probably in one half of the latter cases, at least, the heart, as in asphyxia, is still beating; the action being more like an irritant one on the laryngeal recurrent, and pneumogastric nerves; the other cases are instances of syncope, of convulsive fits, etc.

6. In several cases of death—as in delirium tremens cases, to wit—death occurs because ordinary restoratives do not act, as we have an imperfect reflex and nervous system to work with; but, in all cases of impending death, we are justified in at once having recourse to such means, viz., artificial respiration by pressure, as it acts also on the cavities of the heart; tracheotomy, if we have to fear this form of spasm or asphyxia (the engagement of the double respiratory centre of the pneumogastric being very puzzling under chloroform, but rather of the nature of spasm); sudden cold dashing of water, to wake up the respiratory nerves; fresh air fanned on the face, etc.; too much not to be done at first, as the spasm may subside. Acupuncture of the muscles of the neck is also recommended, so as to irritate the spinal accessory, and phrenic, but not the eighth pair of nerves.

7. Hitherto our experience of this spasmodic irritant condition, and our experience of oxygen gas, galvanism, etc., as restoratives, have not been encouraging; these agents being too irritating, and requiring very exquisite skill to apply them, especially galvanism, which hitherto has only, it is to be feared, done mischief. A better restorative seems to be the injection of warm wine into the rectum, or, as tried in animals poisoned by chloroform, transfusion of any simple saline fluid into the veins, as in the analogous collapse of cholera.